What is claimed is:

1. An apparatus for use in mass spectrometry, said apparatus comprising:

a first set of apertured electrodes having a first potential applied thereto;

a second set of apertured electrodes having a second potential applied thereto;

first and second power sources for generating said first and second potentials, respectively; and

first and second apertured lens elements positioned at either end of said apparatus;

wherein ions are introduced into an entrance end of said apparatus through said first lens element,

wherein said first set of electrodes are interleaved with said second set of electrodes, and

wherein said potentials are applied such that said ions may be selectively trapped in said apparatus or guided through said apparatus.

2. An apparatus according to claim 1, wherein said ions are produced from an ion source selected from the group consisting of an electrospray source, a matrix-assisted laser desorption/ionization source, a chemical ionization source, an atmospheric pressure ionization source, and an atmospheric pressure photoionization source.

3. An apparatus according to claim 1, wherein said first potential is a substantially RF-only potential.

4. An apparatus according to claim 1, wherein said second potential is a substantially DC-only potential.

5. An apparatus according to claim 1, wherein said first and second electrodes are composed of an electrically conducting material.

6. An apparatus according to claim 1, wherein said first and second electrodes are aligned along a common axis.

7. An apparatus according to claim 6, wherein said ions are produced from an ion source positioned orthogonal to said common axis before entering said apparatus through said first lens element.

8. An apparatus according to claim 1, wherein said first electrodes are segmented electrodes.

9. An apparatus according to claim 1, wherein said lens elements are composed of an electrically conducting material.

10. An apparatus according to claim 1, wherein each said second electrode is positioned midway between two of said first electrodes.

11. An apparatus according to claim 1, wherein said potentials are applied to said electrodes such that said apparatus guides ions.

12. An apparatus according to claim 1, wherein said first potential is a sinusoidally time-varying potential.

13. An apparatus according to claim 12, wherein said first potential applied to one of said first electrodes is 180° out of phase with said first potential applied to each adjacent said first electrode.

14. An apparatus according to claim 12, wherein said first and second potentials have a non-zero reference potential.

15. An apparatus according to claim 1, wherein said second potential is applied via a network of resistors and capacitors.

16. An apparatus according to claim 1, wherein said potentials are applied to said electrodes such that said apparatus traps ions.

17. An apparatus according to claim 16, wherein said lens elements are maintained at a DC potential greater than said second potential.

18. An apparatus according to claim 1, wherein said second potential is maintained for a predetermined time, such that said apparatus accumulates and traps ions.

19. An apparatus according to claim 16, wherein said ions collide with a gas within said apparatus.

20. An apparatus according to claim 1, wherein said apparatus begins in a first pressure region of a mass spectrometer and ends in a second pressure region.

21. An apparatus according to claim 1, said ions are introduced from said apparatus into a mass analyzer selected from the group consisting of a multipole mass analyzer, a quadrupole mass analyzer, a hexapole mass analyzer, a time-of-flight mass analyzer, an ion cyclotron resonance mass analyzer, a linear quadrupole mass analyzer, a quadrupole ion trap mass analyzer, a magnetic sector mass analyzer, and an electric sector mass analyzer.

22. An apparatus according to claim 1, wherein said first and second potentials are applied to said first and second electrodes, respectively, via at least one network of resistors and capacitors.

23. An apparatus according to claim 22, wherein said network of resistors and capacitors is configured such that substantially RF-only potentials are applied to said first electrodes through said capacitors.

24. An apparatus according to claim 22, wherein said network of resistors and capacitors is configured such that electrostatic potentials are applied to said second electrodes through said resistors.

25. A method for analyzing a chemical sample, said method comprising the steps of:

generating ions from a sample;

introducing said ions into a first pressure region of a mass spectrometer;

directing said ions into through a first lens element into an ion guide comprising a plurality of first and second apertured electrodes, wherein said first electrodes are segmented, and said first electrodes are interleaved with said second electrodes;

applying first and second potentials to said first and second electrodes via first and second power sources;

utilizing said ion guide to guide said ions from a first pressure region into a second pressure region; and

transferring said ions from said second pressure region into a mass analyzer.

26. A method according to claim 25, wherein an electrostatic potential is applied to said second apertured electrodes as a function of said second apertured electrodes position along a common axis of said ion guide such that said electrostatic potential most repulsive to said ions is applied to said second electrode at an entrance end of said ion guide and said electrostatic potential most attractive to said ions is applied to said second electrode at an exit end of said ion guide.

27. A method according to claim 25, wherein said ions are generated by an ion producing means.

28. A method according to claim 27, wherein said ion producing means is selected from the group consisting of an Electrospray ionization source, a Matrix-Assisted Laser Desorption/Ionization source, an Atmospheric Pressure Chemical Ionization source, an Inductively Coupled Plasma ionization source, a nebulizer assisted Electrospray ionization source, and a plasma desorption ionization source.

29. A method according to claim 27, wherein said ion producing means is operated at substantially atmospheric pressure.

30. A method according to claim 25, wherein said mass analyzer is selected from the group consisting of a quadrupole (Q) mass analyzer, an ion cyclotron resonance (ICR), mass analyzer, a time-of-flight (TOF) mass analyzer, and a quadrupole ion trap mass analyzer.

31. A method according to claim 25, wherein said ions are produced from an ion source positioned orthogonal to said common axis before entering said ion guide through said first lens element.

32. A method according to claim 25, wherein said ions are directed into said ion guide with a trajectory substantially coaxial with said ion guide.

33. A method according to claim 25, wherein said apertures of said first and second electrodes of said ion guide have substantially the same diameters.

34. A method according to claim 25, wherein said first and second potentials are applied to said first and second electrodes, respectively, via at least one network of resistors and capacitors.

35. A method according to claim 34, wherein said network of resistors and capacitors is configured such that substantially RF-only potentials are applied to said first electrodes through said capacitors.

36. A method according to claim 35, wherein said substantially RF-only potentials applied to one of said first electrodes is 180^{o} out of phase with said substantially RF-only potential applied to each adjacent said first electrode.

37. A method according to claim 34, wherein said network of resistors and capacitors is configured such that electrostatic potentials are applied to said second electrodes through said resistors.

38. A method according to claim 34, wherein said capacitors all have substantially the same value.